the backed first partition, i.e. MBR of the hard disk is read out from the data backing up area, then the hard disk partition status during backup is obtained, and the MBR is recovered to the current hard disk.

According to the partition status during backup, for each partition, its backed basic information, such as PBR, concealed sectors of the partition etc., are read out from the data backing up area and recovered; then the backed FAT of the partition is read out from the data backing up area, and according to the occupation status of the clusters in the FAT, backed clusters in the partition are read out and recovered, the FAT is also recovered. After all the backed partitions are recovered, the whole hard disk is recovered to its status during backup.

The invention claimed is:

1. A method for backing up user data in a hard disk, comprising the steps of:

(1) Partitioning off at least a segment of hard disk space from the hard disk and setting it as a data backing up area;

(2) Backing up a partition status of the hard disk and data of at least one partition to be backed into the data backing up area; and

(3) Locking the data backing up area to prohibit the data backing up area from being accessed by other application software or operation systems.

2. A method according to claim **1**, wherein said data backing up area is at an area corresponding to a higher end of logic addresses of the hard disk.

3. A method according to claim **1**, wherein said locking and setting of the data backing up area are implemented by setting a hard disk highest address that is lower than a practical highest space address of the hard disk.

4. A method according to claim **3**, wherein the hard disk highest address is set by the use of a SET MAX command supported by a hard disk area protection function possessed by the hard disk itself, a higher end area of the hard disk with addresses higher than the hard disk highest address is partitioned off and is used as the data backing up area; and areas of the hard disk with addresses lower than the hard disk highest address are used as user's usable data areas.

5. A method according to claim **1**, wherein a size of the data backing up area is determined based on a space practically occupied by the data and information on the hard disk.

6. A method according to claim **1**, wherein hard disk data are written into the data backing up area together with controlling information during the data backup, the controlling information includes information on: a size of the data backing up area, a beginning address of the data backing up area, a size of the backed original partition, a number of original partitions, types of the partitions, a size of the hard disk partition table, and a mark indicating whether the data backing area has been locked successfully.

7. A method according to claim **1**, wherein the locking of data backing up area has two following manners:

(1) Permanent locking: after locking, the data backing up area locked at the higher end will not be able to be accessed, even when the hard disk is re-started after power down, the locked data backing up area still could not be accessed; and

(2) Provisional locking: after locking, the data backing up area locked at the higher end will not be able to be accessed, but when the hard disk is re-started after power down, its locking status will have a value corresponding to the locking status which was last set to the hard disk.

8. A method according to claim **7**, wherein said two locking manners correspond to two setting manners of the SET MAX command, namely permanent setting manner and provisional setting manner.

9. A method according to claim **7**, wherein a mark indicating the locking status is stored in the data backing up area during the backup, and is set as a mark to be locked or a successfully locked mark, indicating accomplished provisional locking or permanent locking respectively.

10. A method according to claim **9**, wherein when the hard disk is started, if said mark is a mark to be locked, then a permanent locking operation is performed to the hard disk, and after successful locking, the mark will be set as a successfully locked mark.

11. A method according to claim **1**, wherein said backing up data into the data backing up area comprises the steps of:

(1) Reading out a main bootstrap record of the hard disk;

(2) Finding out information on each partition according to a hard disk partition information table in the main bootstrap record;

(3) Calculating a data volume in each partition according to a FAT of each partition, calculating a volume required for backing up a partition, and partitioning off a data backing up area from a spare higher end space in the hard disk;

(4) Storing the FAT in each partition and the boosting record sector in the data backing up area; and

(5) For each partition, storing used clusters in a data area of the partition to the data backing up area according to an occupation status of the FAT.

12. A method for recovering data backed and locked in a hard disk from a data backing up area to a partition that is accessible based on operation system, comprising the steps of:

(1) Unlocking the data backing up area; and

(2) Recovering data in the data backing up area to corresponding hard disk partitions according to controlling information stored in the data backing up area, wherein this step includes:

(a) Step of recovering a single hard disk partition, which recovers the data of a certain partition in the hard disk contents backed in the data backing up area; or

(b) Step of recovering the whole hard disk, which recovers the partition status of the hard disk to the status during backup, and recovers the data information in the data backing up area to each corresponding hard disk partition;

Wherein said step of recovering a single hard disk partition or step of recovering the whole hard disk is selected by a user to be performed.

13. A method according to claim **12**, wherein said data backing up area is locked by setting highest address of the hard disk that is lower than the practical highest space address of the hard disk; said unlocking step is accomplished by setting the highest address as the practical highest space address of the hard disk, so that the data backing up area is accessible.

14. A method according to claim **12**, wherein the step of recovering a single hard disk partition includes the following steps:

Starting from a root catalogue, reading out sequentially data in the data backing up area in file manner, redividing the backup of every file into several clusters according to a cluster size of the current partition, reconstituting a cluster chain for every file and storing the cluster chains into the current partition, and modifying the file information in the catalogue such that it will